

by "individual" fissures, and, moreover, the angle formed between its anterior and posterior extremities is raised, and into this space a small accessory branch from the Fissura rhinalis is directed.

Tylopoda.—Pronation is so marked that the F. lateralis is actually situated on the median surface. The F. coronalis is directed from the middle line forwards and outwards.

Suillidæ present several characters in common with the Carnivora. The processus anterior Sylvii is continued into the F. rhinalis, as is also the F. præsylvia.

The F. diagonalis is constantly joined to the F. supra Sylvia, and the posterior end of the F. coronalis joins the F. splenialis.

Hippopotamidae.—Like the pig.

Tapiridæ.—Posteriorly the F. coronalis does not join any other fissure, but anteriorly it communicates with the F. præsylvia, a fact which, though frequent in Perissodactyls, is rare in Artiodactyls.

Nasicornidæ are similar to the Solidungulates.

Solidungulata.—The peculiarities are very constant. Thus there are cross-fissures between F. Sylvii and F. supra Sylvii. Further, there is an accessory longitudinal and parallel fissure on either side of the F. lateralis. Pronation is marked. The F. coronalis is united to the F. supra Sylvii, and the posterior "horn" of the F. coronalis is not united to that fissure, but commencing behind and above the anterior end of F. splenialis, runs forwards and outwards, ending before reaching F. coronalis.

Comparison of the convolutions of the Ungulata with those of the Carnivora shows that in the latter order the first six chief sulci of the Ungulata have undoubtedly their homologues. The question as to whether a F. diagonalis can be said to exist must still be left open, and the remaining three certainly do not always exist in the brain of the Carnivora, and when present are accessory only.

Dr. Krueg thinks that possibly the posterior "horn" (Bügel) of the Fissura coronalis is homologous with the Fissura cruciata in the Carnivora, but this is very uncertain, for it is questionable whether in the Cavicornia the posterior limb of the F. coronalis is homologous with the distinct one described above in the Equidæ. Certainly that of the Perissodactyl is very similar to the Fissura cruciata as regards its relation to the F. coronalis; but while in the Perissodactyl the posterior extremity begins above the F. splenialis, in all Carnivora it begins below. Further, the anterior end of the F. splenialis turning up to the median border has a plausible homology itself with the Fissura cruciata. It would be very interesting to have the time of appearance of the Fissura cruciata fixed, for the latter theory would compare it to the human parieto-occipital fissure. As confirmatory evidence regarding the homology of the Ungulate and Carnivore Fissuræ coroneales, we must note the important fact that similar cortical motor centres are situated around them: this is strongly in favour of Dr. Krueg's view.

University College, London

V. HORSLEY

NOTES

PROF. W. K. CLIFFORD has arrived safely at Madeira. The voyage was rough and stormy, but we are glad to be able to report that he is markedly better than when he left England.

A SUBSCRIPTION has been opened by the Dorpat University for the erection at Dorpat of a monument to the late K. von Baer.

ON January 10 the Imperial Russian Academy of Sciences at St. Petersburg held its annual meeting, which was largely attended this year. The meeting was opened with the reading of the long list of deaths of members, foreign and Russian, during last year, and among whom we notice Regnault, Claude Bernard, Granville, and Bienaimé, at Paris; Hugo Hildebrandt, of

Jena; Friis, of Upsala; Tornberg, of Lund; Lers, of Königsberg; and the well-known Russian archaeologist Polyeff; Kovalsky and Khanykoff, orientalist; and Davydoff, mathematician. Count Orloff-Davydoff, Baron Bühler, and Col. Prjvalsky were elected honorary members; and General Maiefsky, mathematician; General Stebnitzky, geodesist at Tiflis; Mr. Hind (as noted last week), Dr. John Muir (Edinburgh), Clausius (Bonn), Boisier (Geneva), Lavrofsky and Veselago were elected correspondent members of the Academy. The report on the museums of the Academy showed several most important acquisitions, among which we notice the immense and very rich collections of birds, fishes, and reptiles brought in from Central Asia by Col. Prjvalsky, during his second journey; a collection of skulls and bones of Steller's sea-cow, which inhabited, during the last century, the shores of the White Sea, but is now extinct, the collection being made by M. Phillipens on the shores of Behring Strait; and a complete skull of an Elasmotherium, presented by M. Knoblauch. There were, until now, only some teeth of this immense quaternary horse-like rhinoceros at the museum of the Academy, and a part of a skull at the British Museum, which had offered, we are told, a large sum of money to M. Knoblauch for the rarity. The skull was found close by Sarepta, on the banks of the Volga River. The Academy proposes to open next year for the public a large anthropological museum, the materials for which are already in the hands of the Academy; we heartily commend this step, as the museums of the Academy, when open to the public each Monday, are visited by masses of people (as many as 12,000 persons daily on holidays). The report on the works of the philological and historical branch of the Academy was presented by Prof. Suklomlinoff, who dwelt at length on the works of Prince Vyazemsky; and a very interesting paper on the correspondence between Catherine II. and Grimm was read by Prof. Groth. In this branch we notice a great undertaking by the Academy for the next year, being a dictionary of the Kurd language. This language has been very well studied, but there are no dictionaries of it. Now, the Academy will publish a complete one, the materials for it being given by the French orientalist, M. Szabo, and completed by M. Yulpi, who will be intrusted with this important publication.

WE notice an interesting work, just issued in Russia, by Prof. Rumishevich at Kieff, being a complete catalogue of all the medicinal and veterinary literature published in Russia during 1876.

WE learn that the St. Petersburg Academy of Sciences has intrusted M. Keppen with the publication of a complete catalogue of animals living in European Russia.

LORD DUFFERIN, Lord Rosse, and Prof. Roscoe received the degree of LL.D. from Trinity College, Dublin, on Tuesday.

THE "Telectroscope" is the name of a new apparatus, the plan of which was, *Les Mondes* states, recently submitted to MM. du Moncel and Hallez d'Arros by M. Senlecq, intended to reproduce telegraphically at a distance the images obtained in the camera obscura. This apparatus is based on the well-known sensitiveness of selenium to various shades of light.

PROF. EDWARD S. MORSE, we learn from the *New York Nat on*, has written an interesting paper on the "Traces of an Early Race in Japan," which throws light on a subject hitherto wholly obscure. A race of men called Ainos are believed to have come down from Kamtschatka and to have taken possession of Japan, which they held until displaced in their turn by the Japanese from the south. Of the two races, the Ainos and the Japanese, authentic records exist, but nothing has been known concerning the ancient people whose territory was appropriated

by the Ainos. The only knowledge obtained of them has been ingeniously acquired by Mr. Morse by a careful study of "shell-heaps" in all respects similar to those found along the shores of Denmark, New England, and Florida. The deposit discovered by Mr. Morse near Tokio contained pottery and broken bones, many of which were human. It is generally admitted by ethnologists that a people that has once acquired the art of pottery will always retain it; but as neither the Esquimaux, the Kamchatdales, nor the Ainos are essentially earthen-pot-makers, these remains naturally point to the former existence of a race in Japan who preceded the Ainos. Again, both the human and the deer bones found in this shell-heap were broken in a manner to facilitate the extraction of the marrow or to enable them to be placed in a cooking-pot, a circumstance which points to the existence of cannibalism among the people by whom the shell-heaps were made. On consulting Japanese scholars and archæologists Mr. Morse learned that the Ainos were not only not cannibals, but were of an especially gentle disposition. The existence of an ancient race of cannibals in Japan, before the occupation of that country by the Ainos, is therefore made very probable. We hope to see another paper before long containing an account of Prof. Morse's later researches.

PROF. HUMPHRY, F.R.S., of Cambridge, will deliver the biennial oration in memory of John Hunter in the theatre of the Royal College of Surgeons on the 14th proximo.

MR. THOMAS SOPWITH, M.A., F.R.S., F.G.S., who died at Westminster, on Thursday last, was born in 1803, at Newcastle-on-Tyne. He was for nearly fifty years extensively engaged as a civil engineer in mining, railway, and other works, both in this country and on the Continent, and was the author of several works on architecture, isometrical drawing, and mining. In 1838 he was appointed Commissioner for the Crown under the Dean Forest Mining Act, and in the same year a communication made by him to the British Association led to the establishment of the Mining Record Office. He was a member of many of the leading scientific societies, and one of the early members of the Institution of Civil Engineers.

IN connection with our article last week on a proposed Scottish observatory, it may be interesting to state that one day last August Mr. Milne Home, chairman of the Meteorological Society for Scotland, accompanied by Mr. Colin Livingston, headmaster, Public School, Fort William; Mr. Thompson, student; and Mr. David Doig, contractor, ascended Ben Nevis and made several observations with the view of erecting a station on the summit. They found the top enveloped in a mantle of snow—a circumstance which rendered it an extremely difficult task to select suitable spots for the erection of a dwelling-house and observatory. After a careful survey Mr. Home came to the conclusion that the plateau immediately beyond the spring affords the best site. The recommendation this spot has is its contiguity to the water-supply. But it might be questioned whether, as accurate observation is the thing required, it would not be better to erect the observatory on the plateau on the very summit, as there must, no doubt, be a difference between the temperature of the two places, the first-mentioned plateau being 350 feet lower. It is proposed to construct the buildings after the following plan: first, a wall of stone with an inside lining of wood and an inner coating of felt, and the outside of the wall to be covered with corrugated iron. An external wall of stone would also be erected to serve as a protection from the blast. The estimated cost of the structure is 500*l*.

WE learn from the *Colonies and India* that rich discoveries of copper have been made at Howe Sound, a few miles from New Westminster in British Columbia, and that the ore resembles that of the famous Australian Burra Burra mine.

THE Royal Society of Arts and Sciences of Mauritius has recently lost its secretary, Mr. L. S. Bouton, the only surviving founding member of the Society. This society was founded on August 24, 1829, under the name of Société d'Histoire Naturelle de l'Île Maurice, by a few lovers of science; its first secretary was Julius Desjardins, who contributed many papers on the fauna of Mauritius, and also formed a good collection of specimens, which were afterwards given up to Government by his heirs, and became the nucleus of the present museum. The volumes published by the Société during a period of ten or fifteen years contain much interesting information on the natural history of Mauritius. On Desjardins' death in 1840, Mr. Bouton was appointed secretary, and kept up the post till his death; during that long period he chiefly applied himself to the investigation of the flora of Mauritius, and though he never published any complete works he contributed specimens and notes to Prof. Decandolle for the *Prodromus*, and to Kew, for the *Flora of Mauritius* by Baker. He wrote a paper on the medicinal plants of Mauritius, and a very interesting paper on the forests of Mauritius, besides a great quantity of notes in the Society's *Transactions*, and in the newspapers of the colony. In 1846 the Society was allowed by Government an annual subsidy of 200*l*., which has been continued up to this day. Mr. Bouton was also curator of the Museum, but he was, we believe, though completely devoted to his duties of secretary, a rather bad curator. The Museum, although containing some very interesting specimens of the natural history of Madagascar, and of the extinct fauna of Mauritius, was allowed to decay rapidly. No exchanges were carried on to increase the collections, and the space being too limited, the existing specimens are so crowded as to be of no use whatever to the public. The subject attracted the attention of the late much-esteemed governor, Sir Arthur Phayre, and he applied for a Report from the Council of the Society, and on its recommendation the following decisions have been come to by the Council of Government:—That a proper building be provided for the transfer of the Museum now heaped up in a room at the Royal College; that the funds allowed by Government each year be applied to the formation of a local museum, fully illustrating the fauna and flora of the Mascarene Islands, Madagascar, and the islands along the east coast of Africa; that a general collection, of which the present museum should be the nucleus, be gradually formed by means of exchanges to illustrate only the principal genera in each branch of natural history, and give to the public a general view of the natural world; that on vacancy (which is now come) a competent curator be provided from home, who will be at the same time Professor of Natural History at the Royal College, receiving a salary of Rs. 5,000 per annum; that the staff of the Museum be composed of an assistant, who will be also a collecting naturalist, sent round every year to Madagascar or some other place, receiving a salary of Rs. 2,000 and his travelling expenses, a taxidermist, a clerk, and servants; that, as a good taxidermist does not now exist in Mauritius, the services of a proper person be secured from home for two years, to instruct people in stuffing and set up the first collection, receiving Rs. 2,000 and passage-money. We hope that these changes will be insisted upon and that competent men will apply for the vacant posts to the Government at home, and give them a better opportunity of making a good choice. Mauritius is an admirable place for studying the riches of the sea, and a sort of zoological station, like the one at Naples would make many interesting discoveries. Prof. Möbius, of Kiel, who spent some months at Mauritius, said that several years would be necessary for him and many assistants to work up the collections from these seas. Evidently a good opportunity is presented for the promotion of important departments of natural history, and we trust all concerned will seek only to advance the interests of science and the true interests of the colony.

THE Commission of the Municipal Council of Paris has drawn up a report on the working of the electric light, which has been printed, and was discussed on the 14th instant. A certain number of important facts are stated. A Jablochhoff lamp may be said to give a quantity of light equal to eleven gas lamps, consuming each 140 litres per hour. The quantity of gas consumed to produce the same quantity of illumination would be 1,540 litres per hour. The price paid by the city to the gas company for 1,000 litres being 0 fr. 15 c., the expense would be of 0 fr. 23 c. The expenses of each Jablochhoff lamp are officially stated as follows, for 62 candles per hour of light, 77 horse-power:—Machinery, 3 fr. 20 c.; coals for working the several steam engines used, 6 fr. 64 c.; oil for lubricating, 1 fr. 23 c.; pay of men for changing candles and superintending illumination, 3 fr. 20 c.; expenses of 62 candles at 0 fr. 50 c. each, supposed to last during an hour, 31 fr. Total, 45 fr. 27 c., or 73 c. for each candle. The Commission proposes to pay to the Jablochhoff company—which accepts 0 fr. 30 c. per candle during one year—for 62 candles at the Avenue de l'Opéra, 15 on the Place de la Bastille, and 6 in a pavilion of the Halles Centrales: in all 83. The total number of burning hours is estimated at 2,073 for each of the street candles, and 4,000 for each of the pavilion candles: altogether, 55,000. The expense paid to the gas company for illuminating the same places is 21,041 fr. The excess of expense for the city will be 34,044 fr. But this credit is asked for in the interest of science. It is hoped that during one year the Jablochhoff company will realise material improvements, and it is supposed that other electric light companies will tender some fresh propositions for comparison. In the meantime, the Commission proposes to accept a tender made by the gas company to improve the illumination of the Rue du Quatre Septembre, Place du Château d'Eau, and a pavilion of the Halles Centrales, with an excess of consumption of 260,000 cubic metres. At the sitting of the 14th, the gas company refusing to accept the price offered to them as a compensation for their expenses, proposed to supply the gas gratis, which was agreed to. Consequently a regular competition will be carried on between gas and electricity before the Parisian public during one year, on a grand scale, at the expense of only 34,044 fr.

It was recently affirmed in the French Academy that chromic acid might be substituted for vanadic acid in the manufacture of aniline black. An industrial chemist of Rouen, M. Witz, now points out to the Academy (by recommendation of Prof. Girardin) that this is an illusion, and that vanadium is absolutely necessary. Chromium gives a greenish product quite different. M. Witz insists on the small quantity of vanadium which suffices to develop the reaction. It appears that the black is produced in presence of a weight of vanadic acid equal to only the *hundred millionth* part of the weight of the aniline employed. In practice, a thousandth of this weight is quite sufficient, and it will be seen that notwithstanding the high price of vanadium, the use of it in such small quantities is quite practicable for manufacture.

THE Anthropological Exhibition which will be held at Moscow next summer promises to be a highly interesting one. A large series of graphic illustrations of the life of prehistoric man will be supplemented by numerous models of caves, skeletons, and other prehistoric objects. So-called "kurgane" (prehistoric tombs) will be represented containing models of the skeletons and other objects found in them, their various positions being exactly reproduced. Prehistoric skulls will form a separate department of the Exhibition.

WE have received the *Proceedings* of the Cleveland Institution of Engineers, containing the address of the president, Mr. John Gjers, at the annual meeting of November 11. The address refers to various topics of much interest to engineers and even

to men of science. Among other things Mr. Gjers, speaking of the variation in the production of the soil, gives it as his opinion that it is undoubtedly connected with the variation in the number of sun-spots. The December number of the *Transactions* of the Institution of Engineers and Shipbuilders in Scotland contains a paper by Mr. James Howden, "On the Action of the Screw Propeller," followed by a long discussion, and another by Mr. W. G. Jenkins, "On the Scientific Form of Harbours as applied to the Port of Melbourne."

A FOREIGNER, who fears the disappearance of bears in the Alps, the killing of these animals being largely paid for in Switzerland by the State and by the communes, and several wild animals having already disappeared in Switzerland in this way, proposes to form a society which will pay for each disaster caused by bears, and prohibit the hunting of them.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. D. Orpen; a Black-faced Spider Monkey (*Ateles ater*) from South America, presented by Earl Brownlow, F.Z.S.; a Common Seal (*Phoca vitulina*) from Scotland, presented by the Earl of Hopetown; a Dufresne's Amazon (*Chrysotis dufresniana*), a Yellow-Fronted Amazon (*Chrysotis ochrocephala*) from South America, presented by Mrs. T. Smith; a Noddy Tern (*Anous stolidus*) from Ascension Island, presented by Morris H. Smyth Long, Lieut. R.N.; a Tuberculated Lizard (*Iguana tuberculata*) from the West Indies, presented by Dr. Stradling; a Superb Tanager (*Calliste fastuosa*), a Yellow-winged Blue Creeper (*Certha cyanea*) from South America, two Merrem's Snakes (*Liophis merremi*) from Monte Video, deposited; two Cuming's Octodons (*Octodon cumingi*), born in the Gardens.

ON THE LAVAS OF HEKLA, AND ON THE SUBLIMATIONS PRODUCED DURING THE ERUPTION OF FEBRUARY 27, 1878

BUNSEN in a Memoir "On the Processes which have taken place during the Formation of the Volcanic Rocks of Iceland," published in Poggendorff's *Annalen* in 1851, classifies the rocks of the island into two principal groups, which he calls respectively the *normal trachytic*, and the *normal pyroxenic*. The one possesses the largest proportion of acid, and the other of base, and their composition may be approximately stated in the following analyses:—

	Normal trachytic Composition.	Normal pyroxenic Composition.
Silica	76.67	48.47
Alumina and protoxide of iron	14.23	30.16
Lime	1.44	11.87
Magnesia	0.28	6.89
Potash	3.20	0.65
Soda	4.18	1.36
	100.00	100.00

The trachytic rocks represent a mixture of bisilicates of alumina and of the alkalis potash and soda, while protoxide of iron, lime, and magnesia are almost wanting. On the other hand, the pyroxenic rocks are basic silicates of alumina and protoxide of iron, in combination with lime and magnesia, and insignificant quantities of potash and soda. In the trachytic rocks the percentage of alumina is from 10 to 12, and that of protoxide of iron from 2 to 4; while in the pyroxenic rocks the percentage of alumina is from 10 to 18, and that of protoxide of iron from 12 to 20. Normal trachytic rocks are found in great abundance on the banks of the Laxá, at Laugarfjall, near the great geyser, and at Krafla in the north-east of Iceland.

The normal pyroxenic rocks are found on and around Hekla, on the banks of the Thjórsá, and at Thingvellir. Bunsen by an admirable induction, supported by a number of analyses, has proved that the rocks of Iceland which do not closely approximate in composition either to the normal trachytic or the normal pyroxenic, are intimate mixtures of these two classes of rocks,